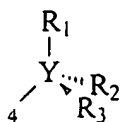


CLAIMS

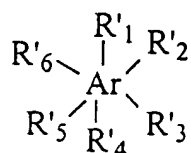
What is claimed is:

1. A method of producing a low dielectric constant polymer, comprising:
providing a thermosetting monomer having the structure

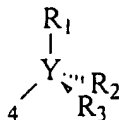


- wherein Y is selected from a cage compound and a silicon atom, and R_1 , R_2 , R_3 , and R_4 are independently selected from an aryl, a branched aryl, and an arylene ether, and wherein at least one of the aryl, the branched aryl, and the arylene ether has a triple bond; and
- incorporating the thermosetting monomer into a polymer thereby forming the low dielectric constant polymer, wherein the incorporation into the polymer comprises a chemical reaction of the triple bond.
2. The method of claim 1 wherein Y is selected from the group consisting of an adamantane, and a diamantane.
 3. The method of claim 1 wherein the aryl comprises a moiety selected from the group consisting of a tolanyl, a phenylethynylphenylethynylphenyl, and a p-tolanylphenyl.
 4. The method of claim 1 wherein the branched aryl comprises a 1,2-bis(phenylethynyl)phenyl.
 5. The method of claim 1 wherein the arylene ether comprises a p-tolanylphenyl ether.
 6. The method of claim 1 wherein at least three of the aryl, the branched aryl, and the arylene ether have a triple bond, and wherein the incorporation into the polymer comprises a chemical reaction of the at least three triple bonds.
 7. The method of claim 1 wherein all of the aryl, the branched aryl, and the arylene ether have a triple bond, and wherein the incorporation into the polymer comprises a chemical reaction of all of the triple bonds.

8. The method of claim 1 wherein R_1 , R_2 , R_3 , and R_4 have a total length L , and the low dielectric constant polymer has a dielectric constant K , and wherein K decreases when L increases.
9. The method of claim 1 wherein the polymer comprises a poly(arylene ether).
10. The method of claim 1 wherein the step of incorporating the thermosetting monomer into the polymer takes place without participation of an additional molecule.
11. A method of producing a low dielectric constant polymer, comprising:
providing a thermosetting monomer having the structure

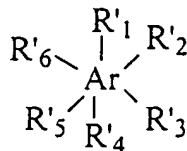


- wherein Ar is an aryl, and R'_1 , R'_2 , R'_3 , R'_4 , R'_5 , and R'_6 are independently selected from an aryl, a branched aryl, an arylene ether, and nothing, and wherein each of the aryl, the branched aryl, and the arylene ether have at least one triple bond; and incorporating the thermosetting monomer into a polymer thereby forming the low dielectric constant polymer, wherein the incorporation into the polymer comprises a chemical reaction of the at least one triple bond.
12. The method of claim 11 wherein the aryl comprises a phenyl group.
 13. The method of claim 12 wherein Ar is selected from the group consisting of a phenyl group and a sexiphenylene.
 14. The method of claim 11 wherein R'_1 , R'_2 , R'_3 , R'_4 , R'_5 , and R'_6 have a total length L , and the low dielectric constant polymer has a dielectric constant K , and wherein K decreases when L increases.



wherein Y is selected from a cage compound and a silicon atom, and R₁, R₂, R₃, and R₄ are independently selected from an aryl, a branched aryl, and an arylene ether, and wherein at least one of the aryl, the branched aryl, and the arylene ether has a triple bond.

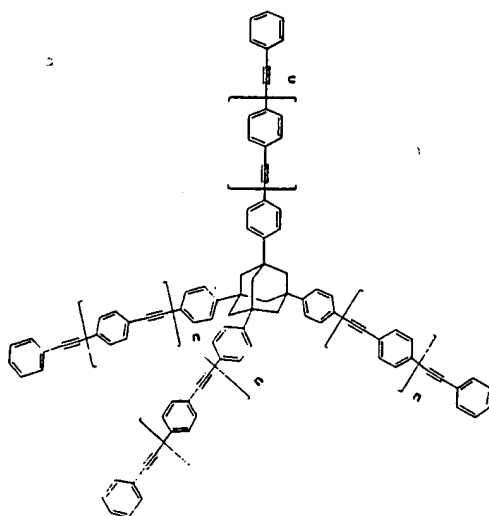
18. A thermosetting monomer having the structure



wherein Ar is an aryl, and R₁, R₂, R₃, R₄, R₅, and R₆ are independently selected from an aryl, a branched aryl, an arylene ether, and nothing, and wherein each of the aryl, the branched aryl, and the arylene ether have at least one triple bond.

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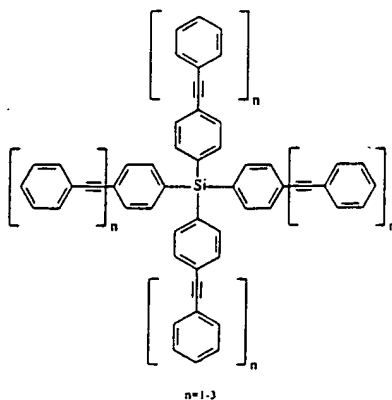
19. A thermosetting monomer having a structure according to formula TM-1:



(TM-1)

wherein $n=1-3$.

20. A thermosetting monomer having a structure according to formula TM-2:

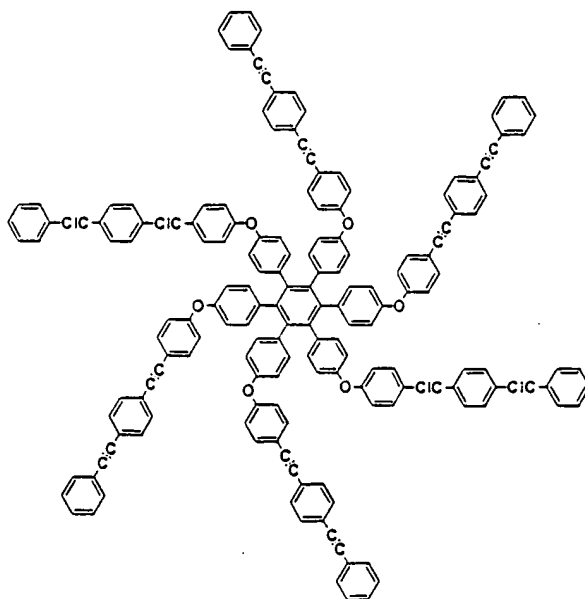


$n=1-3$

(TM-2)

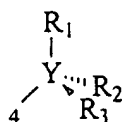
wherein $n=1-3$.

21. A thermosetting monomer having a structure according to formula TM-3:

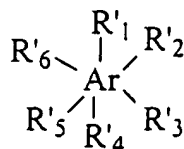


(TM-3)

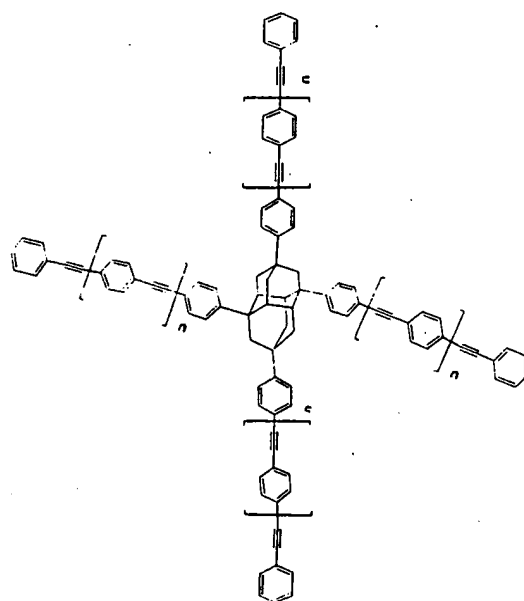
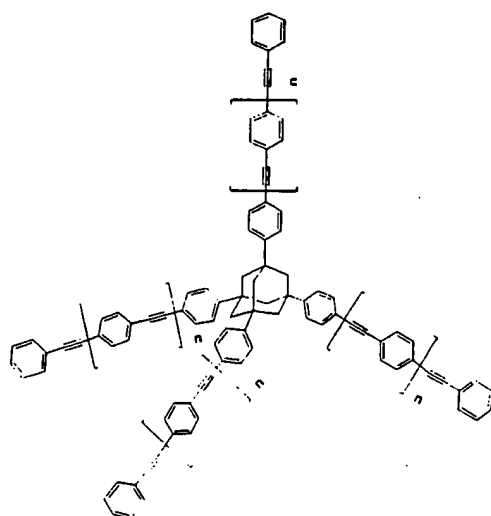
22. An electrical device including a dielectric layer comprising a polymer fabricated from at least one thermosetting monomer from the group consisting of:



wherein Y is selected from a cage compound and a silicon atom, and R_1 , R_2 , R_3 , and R_4 are independently selected from an aryl, a branched aryl, and an arylene ether, and wherein at least one of the aryl, the branched aryl, and the arylene ether has a triple bond;



wherein Ar is an aryl, and R'_1 , R'_2 , R'_3 , R'_4 , R'_5 , and R'_6 are independently selected from an aryl, a branched aryl, an arylene ether, and nothing, and wherein each of the aryl, the branched aryl, and the arylene ether have at least one triple bond;



and:

